

REMARKS

Claim 1 has been amended to recite the fluorine content of the core as previously recited in dependent claim 2, now cancelled. Further, claim 1 has been amended to additionally recite the hydroxyl group content of the core as disclosed at page 8 line 22 to page 9 line 6. As noted in the paragraph spanning pages 1 and 2 of applicant's specification, one problem with prior art optical fiber gratings is that transmission of certain ultraviolet wavelengths tends to degrade the capability of the fiber for transmittance of ultraviolet light. As is taught by applicants at page 8 line 22 to page 9 line 6 of their specification, the amount of hydroxyl group present in the core is important in stabilizing the ultraviolet transmittance capability of the fiber. Specifically, applicants teach "if the content should be less than 4 ppm, the drop in transmittance of the ultraviolet light transmitted through the optical fiber cannot be prevented from occurring; on the other hand, if the content exceeds 7 ppm, a drop occurs in transmittance."

Newly added claim 10 finds support at page 5 line 17-20 of applicants' specification. Newly added claim 11 finds corresponding description in the last paragraph at page 10 of applicants' specification. New claim 12 finds support, for example, in the description of the examples at pages 12 and 13 of applicants' specification. New claim 13 finds corresponding description at page 18 lines 11-13 of applicants' specification.

Responsive to the Examiner's objection to the abstract, a substitute abstract is submitted herewith. The substitute abstract contains no new matter. In order that the examiner can satisfy herself in this regard, a marked up copy of the original abstract,

from which the substitute abstract was typed, is also submitted herewith.

The rejection of claim 1 for anticipation by Saunders is believed to be moot in view of the incorporation of limitations of claim 2 into claim 1, effectively rewriting claim 1 as an independent claim 2.

The rejection of claims 2, 3 and 6 for obviousness over Saunders is respectfully traversed on the basis of the present amendments. Firstly, Saunders does not disclose a hydroxyl content of the core, much less suggest the recited range of 4-7 ppm hydroxyl group, which range is important for the reasons taught at page 8 line 22 to page 9 line 6 of applicants' specification. Secondly, Saunders does not suggest the fluorine content of 100 to 1000 ppm for the core. The Examiner writes "Saunders covers all possible amounts of fluorine...". Of course, the issue properly framed is not what Saunders "covers" but, rather, whether or not Saunders fairly suggests applicants' specific range of 100 to 1000 ppm. Saunders only teaches us that "low concentrations [of fluorine] in the cladding" diffuse into the silica core by heating. See column 4, lines 33-40. If the Examiner believes that such "low concentrations" in the cladding would diffuse into the core upon heating to produce a concentration within applicants' recited range, she should substantiate that position with some form of evidence. Thirdly and finally, Saunders does not suggest a fiber formed by irradiation with a femtosecond laser or a picosecond laser.

The rejection of claim 4 for obviousness over Saunders in view of Imamura et al. is respectfully traversed because Saunders et al., as modified by Imamura et al, still would not have the amounts of fluorine and hydroxyl groups in the core recited by

applicants' claims, as noted above. Also a suggestion of a grating formed by a femtosecond or picosecond laser would still be lacking.

The rejection of claim 5 for obviousness over Saunders in view of DiGiovanni et al. is respectfully traversed for the same reason that the rejection of claim 4 is traversed above, i.e. Saunders so modified would still not meet applicants' recited ranges for fluorine and hydroxyl content and would not have a fiber grating formed by a femtosecond laser or a picosecond laser.

The rejection of claims 7 and 9 for obviousness over Kashyap in view of Dunn et al. is also traversed on the basis of the present amendments. Kashyap does not suggest formation of a grating in the core. Rather, as the Examiner correctly notes, Kashyap forms a grating in the cladding. In connection with this distinction, the Examiner notes "this method is capable of also forming a grating upon the core, since..." However, such capability does not establish a *prima facie* case for obviousness. As noted in MPEP 2143.01 "fact that claimed invention is within capabilities of one of ordinary skill in the art is not sufficient by itself to establish *prima facie* obviousness," citing Ex parte Levengood, 28 USPQ 2d 1300 (Bd. Pat App. & Inter. 1993).

As the Examiner further notes at the top of page 8 of the Office Action, at column 5 lines 22-26, Kashyap discusses the use of a hydrogen treatment in order to raise the photosensitivity of the core layer in the context of a core layer which is Al or P doped. Kashyap goes on to teach that "the core may alternatively be doped with Ge and/or B to achieve photosensitivity." Kashyap goes further to teach "the present invention provides an alternative approach. In accordance with the invention, the cladding

material of the fiber is rendered photosensitive." In other words Kashyap teaches that his invention, the hydrogen treatment, and the doping with Ge and/or B, are alternative approaches to producing a desired level of photosensitivity in the core. In the view of Kashyap, the alternative offered by his invention is superior to the afore-mentioned alternatives in that it allows for wider latitude in the doping of the core and the refractive index of the core. Kashyap nowhere suggests that it would be in any way desirable to add a hydrogen treatment to the process which he regards as his invention.

As the Examiner notes "Kashyap discloses the use of interfering beams to form the grating. Dunn et al. disclose the use of a femtosecond beam to induce refractive index changes within a waveguide free of germanium." What the Examine fails to note is that Dunn et al. do not employ interfering beams. Their method involves translation of the glass substrate in the direction perpendicular to the direction of beam propagation, as taught at column 5 lines 12-16. The Examiner provides no reason why one skilled in the art would have been motivated to use the laser apparatus of Dunn et al. without the method taught by Dunn et al. for its use, i.e., a method which does not involve the use of interfering beams as in Kashyap.

Finally, the rejection of claim 8 for obviousness is also traversed. Even modified in view of Kazuhai, the basic combination of Kashyap and Dunn et al. fails to suggest applicants' claimed method for the reasons noted above in connection with the rejection of claims 7 and 9.

In conclusion, it is respectfully requested that the Examiner reconsider the rejections of record with a view of the present amendments and foregoing comments, with a view toward allowance of the claims as amended.

Respectfully submitted,

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